THE PERFORMANCE OF JAPANESE EQUITY CARVE-OUTS

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Summary

This study is enlightened by the wave of conglomerates break-up in 2019. This study aims to answer the following questions. Firstly, does the valuation effect of equity carve-outs (ECOs) exist in Japanese stock market as in the United States? Secondly, how do parent companies and their subsidiaries perform after the equity carve-outs transaction? Does their operating performance improve during the process? Employing a classic event study approach, this study yields the following findings. Firstly, the valuation effect does exist in Japanese stock market, meaning that the announcement of equity carve-outs can bring positive abnormal return for the shareholders of parent company. Secondly, the operating performance of both parent companies and subsidiaries do not improve, rather they deteriorate in the process. Thirdly, the market reacts more positively towards the equity carve-outs of parent company which has good profitability and high leverage. This finding adds credibility to the parent-financing hypothesis of ECOs.

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Abstract

This study examines the valuation effects of equity carve-outs (ECOs) in Japanese stock market. Through classic event-study methodology, this paper finds that market reacts positively to the announcements of equity carve-outs. ECOs announcements yield statistically significant positive abnormal return for shareholders of the parent companies and consequently create the wealth effect. However, a notable stock price reverse is spotted in the subsequent period of ECOs transaction which lasts up to 24 months at least. This study also examines the changes in the operating performance and leverage level of both parent firms and subsidiaries surrounding the carve-out year. This paper finds that operating performance of both parent firms and subsidiaries deteriorate after ECOs transaction and the leverage level of parent firms and subsidiaries drops after carve-outs transaction. Lastly, this study finds that Japanese stock market favors equity carve-outs of parent company which has good profitability and high leverage.

1. Introduction

Corporate fashions ebb and flow, and in 2019 it is the industrial break-ups. In Europe and the United States, once-straggling conglomerates, using spin-off or equity carve-outs, are sculpting their divisions into more focused subsidiaries which outside investors hope will grow better on their own. The management of conglomerates also faces pressure from activist investors to spin-off part of its business. Third Point, a U.S. hedge fund, has reiterated calls for Sony to spin off its chip segment and sell holdings in other units deemed a drag on corporate value. Reorganizing a company becomes necessary when the company grows to a tipping point that its current structure can no longer fulfill the goal of the management. Under those situations, the company might choose to carve-out some of its divisions or units into subsidiaries to create a more efficient entity by putting primary focus on core business, wiping out the negative synergy effect between some unrelated divisions and reducing leverage level. Considering all these merits, it should not come as a surprise that corporate break-up is seen as a new growth engine for the company and is often welcomed by the market and shareholders who would like to see their share price increasing.

Equity carve-outs (ECOs) is a common way for a company to conduct a corporate break-up. In a typical ECOs, a parent firm sells part of its subsidiaries' outstanding shares through initial public offering (IPO), and during this process a newly listed entity is created. Using a classic method of event study, previous researches (Allen & McConnell, 1998; Schipper & Smith, 1986) find that stock market in the United States reacts positively toward this kind of corporate break-up. In other words, equity carve-outs are able to, at least in short-term, enhance the wealth of shareholders of parent companies that choose to conduct an ECO.

Previous researches try to explain why there will be a valuation effect. Allen (1998) points out that ECOs create an incentive mechanism for the management of newly listed subsidiaries. Klein et al. (1991) find that in the United States many of the public-listed subsidiaries will be delisted or be cut from the parent-subsidiary relationship. Also, they find that parent firms in the United States tend to re-acquire the subsidiary or dispose their interests in the subsidiary not long after the ECOs process. Adding more credibility to their study, Otsubo (2009) argues that in the United States ECOs
are usually followed by the following four events: re-acquisition, spin-off, secondary offering and sell-offs. These four kinds of events can lead to the disintegration of parent-subsidiary relationship. Other researches concentrate on the existence of asymmetric information between the management of parent companies and outside investors. Powers (2003), Slovin, Shuka, Ferraro (1995), and Nanda (1991) suggest that ECOs is a way for parent firms to exploit the overvaluation and undervaluation in the stock market. Notably, from the standpoint of managers of parent firms, equity carve-outs is a favorable approach of fund-raising especially when the capital market over-values the subsidiaries and under-values the parent companies. There are also some prior researches explaining this phenomenon in different ways. For example, Shleifer and Wolfenzon (2002) have pointed out that a country/region's legal system will have a huge impact on the management's decision to be publicly listed. A fully functional protection of minority shareholders is able to magnify the efficiency of contracts and lower the cost of external financing (Berkowitz et al., 2003; Espenlaub et al., 2016; LaPorta et al., 2006). Therefore, Dasilas and Leventis (2017) argue that market with better protection of minority shareholders will very likely favor equity carve-outs and market with flawed protection of investors probably will have a second thought on ECOs.

In Japan, equity carve-outs was as active as that of the United States, at least in the first half of 2000s. But the parent-subsidiary situation is quite different between Japan and the United States. In Japan, those conglomerates tend to have many listed subsidiaries under their umbrella.

Most of these listed subsidiaries used to be a unit or division of their parent companies. Take Hitachi Ltd as an example. Before the Lehman shock, Hitachi had more than 20 listed subsidiaries such as Hitachi Metals, Hitachi Chemicals and Hitachi Cables, which are referred as the Big Three of Hitachi group. Also, in Japan parent companies usually remain the parent-subsidiary relationship with subsidiaries long after the equity carve-outs. Therefore, in Japan we rarely spot those four kinds of subsequent events (re-acquisition, spin-off, secondary offering and sell-offs) that are ubiquitous in the U.S. market. Therefore, the subsequent event hypothesis cannot explain the valuation effect of equity carve-outs, if there is one, in Japan.

The public offering of a subsidiary has a significant impact on the parent company. The shareholder composition will change drastically as the shareholding ratio of the parent company will decrease due to the issuance of new shares of the subsidiary at the time of public offering or the sale of shares of the subsidiary by the parent company. In addition, the public offering will increase the social awareness of the subsidiary, but on the other hand, the responsibility for providing information to outside investors will increase. How will these changes affect the parent company and the subsidiary.

This paper empirically analyzes the effects of public offering of the subsidiary on the parent company. Specifically, by analyzing changes in the stock price of the parent company and changes in the performance of both parent company and the subsidiary due to the disclosure of the subsidiary, this study will verify whether the disclosure of the subsidiary has a positive effect on the wealth of shareholders of parent companies.

The rest of this study is arranged as follows. Section 2 presents the previous research on equity carve-outs. Section 3 presents a theoretical analysis on ECOs. Sections 4 introduces the

sample selection and the methodology employed. Section 5 shows the main empirical results. Finally, section 6 concludes the findings on Japanese equity carve-outs.

2. Previous research

To investigate the valuation effect of equity carve-outs, plenty of previous researches choose to employ the approach of empirical research on both short-term market reaction and long-term market reaction.

2.1. Short-term market reaction to equity carve-outs announcements

The majority of previous research focusing on equity carve-outs has concentrated on the stock market reaction to equity carve-outs announcements. By investigating 76 equity carve-outs cases in the mid-90s, Schipper and Smith (1983) find that shareholders of parent companies will earn, on average, a 5-day excess return of 1.83% surrounding the announcement of carve-out plan. Slovin, Sushka and Ferraro (1995) investigate stock price movement of listed parent companies which are in the same industry of carved out subsidiaries. They find evidence that the stock price of these companies tends to fall, although by a small margin, after the announcement of equity carve-outs. However, the problem of small sample definitely lowers the credibility of their research. Allen and McConnel (1998), by looking into about 180 cases of equity carve-outs since 1978, argue that shareholders of parent companies will enjoy, on average, a 3-day excess return of 2.12% surrounding the announcement of equity carve-outs. They also check out the way these parent companies make use of the funds raised from equity carve-outs. In the sub-group of 54 companies which used the funds to pay off debts and pay dividends to shareholders, the stock price of these parent companies rises 6.63% on average. In the sub-group of 60 companies which used the funds to invest in value-enhancing projects, the stock price of these parent companies drops 0.01% on average. Dasilas and Levantis (2018), using 60 European carve-outs cases, argue that the stock price of parent firms will have an abnormal return of 1.67% on event day. Prezas, Tarimcilar and Vasudevan (2000) suggest that the stock price of subsidiaries rises 5.83% and 5.43% on the first day and after 7 trading days respectively. Many researches have tried to explain the positive cumulative abnormal returns surrounding equity carve-outs announcements. Several hypotheses are put forward to explain this phenomenon. The first one is the asymmetric

information hypothesis. In terms of the asymmetric information hypothesis, Powers (2003), Slovin, Shuka, Ferraro (1995), and Nanda (1991) suggest that ECOs is a way for parent firms to exploit the overvaluation and undervaluation in the stock market. Notably, from the standpoint of managers of parent firms, equity carve-outs is a favorable approach of fund-raising especially when the capital market over-values the subsidiaries and under-values the parent companies. Therefore, the asymmetric information hypothesis predicts that market will have a positive stock price reaction for parent companies on event day and subsidiaries will suffer negative returns. This hypothesis concentrates on the information asymmetry between managers of parent firms and investors. The second one is the divestiture gains hypothesis. Schipper and Smith (1986) attribute positive abnormal returns to four reasons. Firstly, an equity carve-out can facilitate parental focus and uncover hidden value by letting market to re-value the new independent entity. Secondly, parent companies can raise funds from carve-out transaction and invest in more profitable projects. Thirdly, the carve-out subsidiary will be obliged to public scrutiny after going public and more information will be available to the outside investors. Fourth, new market-based compensation contracts may require managers to exert more efforts to act in better interests of shareholders (Prezas et al., 2000). The third one is the subsequent event hypothesis. Otsubo's (2009) study focuses on the wealth gain of parent company's shareholders associated with the combination and ECOs and four subsequent event (merger and acquisition activity, secondary offering, re-acquisitions and spin-offs). According to Otsubo (2009), these four secondary events play an important role in building the market reactions to the ECOs announcements of parent company. Otsubo looks into 201 ECOs cases carried out by non-financial companies in the United States. He suggests that market reaction is positive when the parent-subsidiary relationship is maintained after an ECO. When these four secondary events are announced, the market reacts differently to parent firms and subsidiaries. Also, he finds a significant stock price increasing trend for parent companies if the secondary event happens to be a merger and acquisition activity. Based on these findings, he put forward the hypothesis that the market views the combination of ECOs and four kinds of subsequent events as a restructuring and reacts positively to it. The fourth one is the parent-financing hypothesis. An equity carve-out transaction can raise funds for a parent company by selling a portion of subsidiary's outstanding shares. Allen and McConnell (1998)

argue that in United States companies choose to carve-out a subsidiary only when they are facing financial constraints caused by poor operating performance and high leverage. They also find that U.S. stock market reacts positively to the very kind of ECOs in which the parent firms use the funds raised from ECOs to pay off debt. Thus, they argue that financial restructuring is the root cause of valuation effect of equity carve-outs. Otsubo (2013) adds credibility to this hypothesis by using Japanese ECOs cases.

2.2. Long-term market reaction to equity carve-outs announcements

Other literatures focus on long-term market reaction and operating performance of parent company and subsidiary. Employing 91 ECOs cases, Michaely and Shaw (1995) argue that more-leveraged and less-profitable companies tend to choose spin-offs over equity carve-outs. They also find that stock price performance and operating performance of ECOs parent companies is better than that of spin-off parent companies.

Madura and Nixon (2002) employ 88 equity carve-outs cases between 1988 and 1993 to analyze the long-term stock performance of parent companies. They use buy-and-hold abnormal returns (BHARs) to measure long-term market reaction over 4 time-intervals (6 months, 12 months, 24 months and 36 months). Their results show that the average cumulative abnormal return (CAR) for parent firms relative to the matched firms is -39.6%, meaning that in the long run, the ECOs do not enhance shareholder value of parent firms.

Powers (2003), using 181 equity carve-outs samples, suggests that there are positive cumulative excess returns during the period of year 1 subsequent to carve-out year and year 3. During year 4 and year 5, however, the cumulative returns become negative.

Gleason et al. (2006) investigate the following performance of ECOs cases that are re-acquired. They suggest that re-acquired subsidiaries firms perform considerably worse than those entities that are not re-acquired. They also find that parent firms enjoy positive buy-and-hold returns when parent firms fully re-acquire the subsidiary and suffer from negative BHARs when they partially re-acquire the subsidiary. Therefore, they put forward a hypothesis that long-term performance after re-acquisition is dependent on the degree to which the parent firms re-combine the subsidiary entity.

Thompson (2013) investigate the long-term performance by virtue of 91 re-acquired

carve-outs cases. He suggests that 18-month returns and re-acquired carve-outs 3-year returns of parent firms are both negative.

Pojezny (2006) examines the short-term market reaction of 100 European equity carve-outs cases over the period of 1984 to 2004. His main finding is that equity carve-outs announcements can lead to a stock price jump on event day (day 0). However, an instant price reverse offsets all the profits gained on that day. Another goal of his research is to examine the long-term performance of parent company and subsidiary. He finds little evidence of statistically significant positive abnormal operating performance in the 2nd and 3rd year following the equity carve-outs transaction, lowering the credibility of divestiture gains hypothesis, according to which the parent company should enjoy an increase in operating performance following the equity carve-outs transaction. For subsidiaries, he claims that growth continues to be positive in the two years following the equity carve-outs, showing that part of the standalone gains may be permanent.

3. Theoretical analysis

3.1. Definition of equity carve-outs

Equity carve-outs refers to the parent enterprise carving out a subsidiary enterprise (or setting up a new subsidiary enterprise with part of its business) and offering part of the subsidiary enterprise's equity to the public in the capital market. In the new listed enterprise, the parent enterprise may still hold the controlling rights or give up the status of majority shareholder.

The listed subsidiaries in the carve-outs formed new legal entities and obtained a large amount of cash returns. Therefore, the carve-outs behavior is a derivative form of the enterprise's birth. At the same time, for the listed parent firm, this is equivalent to the secondary sale of the shares held, which obtains a higher premium return. If the parent enterprise holds all the shares of Enterprise A, then after the equity carve-outs, other public shareholders and the parent enterprise hold the shares of Enterprise A. The equity carve-outs has expanded the scope of the parent enterprise's asset control. However, the equity carve-outs have formed a new subsidiary with an independent management team. The control rights of the parent enterprise have been greatly

reduced, and the reduction of the business scope of the parent enterprise has made its main business more prominent. Therefore, from this perspective, the academic circle classifies equity carve-outs as an important way to slim the parent firms.

3.1.1. Explanations from relevant economic theories

Equity carve-outs is a ubiquitous financial phenomenon in the capital market. Scholars have done a lot of research on equity carve-outs from the economic theory and use many economic theories to explain the pervasiveness of equity carve-outs. This study describes the viewpoints of several economic theories on equity carve-outs.

The enterprise boundary theory argues that equity carve-outs is to re-divide the enterprise boundary of listed enterprises, so that the enterprise size can be appropriately reduced and a new and appropriate enterprise boundary can be established. In this way, the purpose of reducing costs and improving the efficiency of resource allocation can be realized.

The information asymmetry hypothesis argues that information asymmetry exists widely between the managers of listed enterprises and public investors. Carving out a subsidiary for going public can make subsidiaries optimize their governance structure, announce more detailed information, and enable investors to better understand the operation of the new entity. Equity carve-outs can solve the under-estimation of subsidiaries caused by asymmetric information and market can better evaluate the value of the parent firm.

The manager hypothesis argues that the manager of the subsidiary enterprise cannot obtain benefits from the equity incentive of the parent enterprise, while the manager of the subsidiary enterprise can obtain the shares of the subsidiary enterprise after the equity carve-outs, so that its benefits are consistent with that of the subsidiary enterprise, thus making the manager of the subsidiary enterprise continuously strive to improve the enterprise's performance.

The core strategy hypothesis argues that the development direction of the enterprise should focus on its advantageous businesses. Carving out subsidiaries which are unrelated to the parent enterprise's main business can improve the business concentration of the parent firms, improving the operation efficiency of the parent enterprise, reducing the negative synergy between the parent firms and subsidiaries, and thus improve the equity value of the parent firm.

3.1.2 Comparison between carve-outs and spin-off

As two important ways to slim the enterprise, both carve-outs entity and spin-off entity are independent subsidiaries from the parent enterprise, but they have the following significant differences. Firstly, in a spin-off process, the shareholders of the original parent company completely acquire the shares of the separated subsidiary company. However, in the carve-outs process of the subsidiary enterprise's public listing, part of the shares of the subsidiary enterprise were obtained by public investors. Secondly, the subsidiary enterprise will no longer be controlled by the parent enterprise after spin-off. However, in the carve-outs, the parent enterprise usually only sells a small portion of its shares and rarely loses its controlling shares voluntarily. Finally, the subsidiary did not obtain new capital flow after being divided, while the carve-outs subsidiary could obtain new capital inflow due to the sale of equity.

There is also a close connection between the two methods. In some mature capital markets, there are some cases of carve-outs first and then spin-off. For example, because the shareholders of the parent enterprise do not recognize the equity value of the subsidiary enterprise, however, it is often not supported to directly spin-off the subsidiary enterprise to the shareholders of the parent enterprise. If the parent firm carve out subsidiary enterprise first, the capital market will make righteous evaluation on the equity value of the subsidiary enterprise. When the stock price of the subsidiary enterprise performs well, it will be very easy to spin-off the subsidiary enterprise.

3.2. Types of equity carve-outs

There are mainly three types of equity carve-outs; mixed equity carve-outs, horizontal equity carve-outs and vertical equity carve-outs.

The mixed equity carve-outs is mainly used by parent enterprises that carry out the diversified development strategy. Due to the weak correlation between the subsidiary's main business and that of the parent firm, the parent enterprise and the subsidiary enterprise are more difficult to manage the growth goal due to the scattered business, and the efficiency of resource allocation becomes worse, resulting in negative synergy effect. Therefore, carving out the subsidiary enterprise by initial public offering alone can better support the development of the

subsidiary enterprise, and at the same time reduce the operating difficulty facing the parent company, in this way both parent firm and the subsidiary can focus on the development of their respective main businesses and improve their competitiveness.

Horizontal carve-outs refers to the carve-outs of the parent enterprise's equity, in which the parent enterprise becomes several new enterprises, while the carve-outs subsidiary enterprise and the parent enterprise are engaged in the same business, and the subsidiary enterprise is put on sale for the first time.

Vertical carve-outs refers to the parent enterprise with a long industrial chain carving out one of its industrial links. For example, a new subsidiary enterprise will be set up independently from one of the links of raw material supply, smelting and sales of a smelting enterprise and will be put on sale. Parent and subsidiary enterprises are in the same industry, but their respective businesses are in different positions in the industrial chain.

There are many reasons for carve-outs, and the research on it is relatively mature at home and abroad. The main viewpoints are summarized as follows. Firstly, ECOs can open up new financing channels. For some listed enterprises, carve out up a subsidiary and listing can raise new funds for the business development of the subsidiary. With the growth of operating performance, the subsidiary can also apply for a rights issue to further raise funds. This can actually lighten the burden on the parent enterprise and achieves the goal of opening up new sources of funds. Secondly, ECOs can help shareholders obtain excess investment return. For some businesses that are suitable for carve out, the stock price of the parent enterprise may not fully reflect the real value of the business. Therefore, carve out the business into a subsidiary enterprise and listing it can enable it to get a higher valuation in the securities market. Sometimes the stock price of the subsidiary enterprise can even get a high market popularity, and the parent enterprise can get a considerable premium on the equity of the subsidiary enterprise. In addition, as a shareholder of the subsidiary enterprise, the parent enterprise enjoys the performance dividends of the subsidiary enterprise at the same time and has obtained a stable source of income. These two aspects can greatly improve the performance of the parent enterprise. Thirdly, ECOs can push up the stock price, at least in short-term. The securities market has the function of value discovery, and the current stock price can reflect the future value of the enterprise in advance. The parent enterprise

that has carve out up and listed can obtain capital gains at a higher premium after the subsidiary enterprise goes public, thus increasing the stock price of the parent enterprise in the secondary market and increasing the total market value of the enterprise. Fourth, ECOs can reduce incentive cost through public supervision. Equity carve-outs can promote public supervision of relevant listed enterprises. Enterprises that carve out up and list will usually implement equity incentives to enable professional managers and core employees of the enterprise to obtain part of the equity, thus binding the interests of the enterprise and employees. Enterprises that have been listed on the main board market can make the management and some main employees have certain shares in the enterprises that are about to be carve out and listed through various channels, thus making the management and the carve out enterprises closely combine in economic interests, reducing the principal-agent cost, contributing to the sustainable development of the enterprise and reducing the internal incentive cost of the enterprise. Fifth, ECOs help both parent companies and subsidiaries focus on core business and market segment. The equity carve-outs make the subsidiary enterprise become an independent legal entity, which is usually greatly reduced by the influence of the parent enterprise and has greater autonomy in formulating and developing the enterprise's operating policies. At the same time, the parent enterprise can also focus more on its main business, making the investment more concentrated.

In Chinese stock market, with the support of the policy, domestic A-share listed enterprises have been able to carve out their subsidiaries and let subsidiaries go public on the Growth Enterprise Market (GEM). Combining the two main factors of parent-subsidiary business characteristics and carve out motivation, and referring to relevant cases of equity carve-outs at home and abroad, the future carve out of subsidiaries of domestic A-share listed enterprises and listing on the Growth Enterprise Market can be divided into the following three models. The first one is PE incubator model. This model is one of the first and most easily accepted models in the current market. The listed enterprises involved are basically based on the "venture capital concept" previously recognized by the market. Most of these enterprises exist in the form of PE-type industrial groups. As carve-outs will help to provide an effective exit channel for venture capital, such enterprises have high enthusiasm to promote the carve-outs of their subsidiaries.

Most of these enterprises are of a comprehensive nature, and their main businesses are

weakly or even unrelated to their subsidiaries. According to the requirements of the China Securities Regulatory Commission (CSRC) for carve-outs, "there is no competition between listed enterprises and issuers in the same industry and a promise of non-competition in the future", IPO applications for carve-outs subsidiaries of such enterprises are more easily approved. The second one is proximate business model. In this model, parent enterprise carve-outs one or more of its subsidiaries to focus on emerging sub-sectors. Generally speaking, the parent company in this model has a prominent position and business scale in its industry, at the same time the subsidiary enterprise is often the leader in the emerging sub-sectors, and its competition in core business and management has greater advantages. The third one is different business model. In this model, the parent enterprise and the subsidiary enterprise are generally located in different industries, and the business lacks relevance. The business scope of the parent enterprise is mostly traditional industries, while the business scope of the subsidiary enterprise is mostly emerging industries, such as electronic information, new energy, new materials, biomedicine, etc. In this model, due to the lack of correlation between the parent enterprise and the subsidiary enterprise's business, the parent enterprise is relatively willing to promote the equity carve-outs from the perspective of broadening the financing channels for its new business.

The biggest difference between this model and PE incubator model is that the parent enterprise of this model is mainly motivated by building a long-term capital financing platform for the business development and growth of subsidiaries, rather than simply looking for a channel for venture capital to withdraw.

3.3. Advantages and disadvantages of equity carve-outs

3.3.1. Advantages of equity carve-outs

Equity carve-outs has many advantages for both parent enterprises and subsidiaries. It is these advantages that enable many enterprises at home and abroad to restructure their enterprises through equity carve-outs, thus promoting the development of the enterprise's capital operation or emerging businesses. The advantages of enterprises that carve out up and go public mainly include the following aspects. Firstly, shareholders of parent companies can obtain high returns. If the subsidiary enterprise is successfully carved out and go public, the circulation of the subsidiary enterprise's shares in the secondary market will make it easier for the parent enterprise's shares to

be sold, and once sold, considerable excess investment returns will be obtained. At the same time, the parent firm, as the shareholder of the subsidiary enterprise, has the right to enjoy the dividends of the subsidiary enterprise, thus enjoying a stable source of profits and thickening the enterprise's performance. Secondly, ECOs can push up the stock price. More often than not, subsidiaries will get a certain premium after listing, which is a major benefit to the parent enterprise that holds the shares of subsidiaries. The capital market will respond to them in advance, and the stock price of the parent enterprise will get a certain increase, thus increasing the total market value of the parent enterprise. Thirdly, ECOs can open up new financing channels. Equity carve-outs can enable an asset to be used twice and obtain new funds. At the same time, subsidiaries can timely issue shares and issue additional shares to obtain more financing after listing, thus enabling the enterprise to have more financing channels. This has a strong attraction for enterprises with only a single financing method, especially A-share listed enterprises. Thirdly, ECOs can help diversifying investment risks. After the subsidiary enterprise goes public, it will become a public enterprise, and the parent enterprise and public investors will jointly invest in it and bear the operating risks, which greatly reduces the risks of the parent enterprise operating the subsidiary enterprise alone. Especially for some high-tech industries whose prospects are still uncertain, the parent enterprise is more inclined to carve out them up and list them to transfer its risks.

3.3.2. Disadvantages of equity carve-outs

Although equity carve-outs has many advantages, its disadvantages are unavoidable. If a listed enterprise wants to carve out its subsidiary and make the subsidiary a public company, it must take into consideration its various drawbacks and make trade-offs. For parent companies, there are two main demerits. The first demerit is the conflict of interest issues with minority shareholders. As a result of the initial public offering, minority shareholders will be generated, which may cause the mismatch of profits of the parent company and those of the subsidiary. For example, when the subsidiary is a sales and marketing company of the product of the parent company, the parent company imposes an unreasonably high purchase price on the subsidiary, and the parent company gains profit at the expense of the profit of the subsidiary. The fact that a transaction that unduly harms one of these parties or that is under conditions that are significantly different from the ordinary transaction conditions is a requirement for public offering of the stock,

and even after the public offering, transparency between the parent company and the subsidiary is required for the business relationship. As a result, transactions between parent and subsidiary companies will be more complicated than before the disclosure. For example, in the case of joint sales, investment, research and development, etc., transparent transactions are required so that the independence of each unit is ensured. The second demerit for parent company is the delay in decision making as a group. The public offering strengthens the independence of the subsidiary and requires transparency in the transactions between the parent and subsidiary companies as mentioned above. This means that when the corporate group acts as a unit, coordination between the constituent companies takes time. Consequently the decision-making process in the corporate group may be delayed. For the subsidiaries, the ECOs also have two main demerits. The first one is the rise of possible hostile takeover. The second one is the requirement of information disclosure. When the company goes public, it is necessary to have a detailed disclosure of the contents of the company, such as the issuance of a securities report due to the regulations of the Securities and Exchange Law. In addition to requiring clerical work for disclosure, it may be considered that in some cases the transmission of disclosed corporate information to competitors has a negative effect on competition between companies.

4. Data and Methodology

4.1. Sample selection

This research examines a sample of Japanese firms which have engaged in equity carve-outs between 2000 and 2010. However, this study extends the data set to 2012 in order to evaluate long-term stock price performance and operating performance two years after equity carve-outs. The procedure of sample selection obeys the following order. Firstly, this study conducts the sample selection by finding out all subsidiaries which went public between 2020 and 2010 from the White Paper of Capital Increase (増資白書), the White Paper of IPOs (株式上場白書), the White Paper of JASDAQ IPOs (JASDAQ 上場白書).[1] Secondly, this study excludes those subsidiaries whose parent firms own less than 50% of outstanding shares before the equity carve-outs. Next, this study excluded those subsidiaries which registered on the OTC market

[1] These white papers are published annually and contain information about IPOs in Japan

before equity carve-outs. Also, subsidiaries whose announcement days cannot be clearly identified were also excluded from the sample. Lastly, in the hope of getting a cleaner estimation of market model, I excluded those subsidiaries during whose estimation window there were equity carve-outs announcements of other subsidiaries. The whole process rendered a final sample of 96 equity carve-outs cases. The data are gathered from various sources. Data on daily closing stock prices of parent firms are gathered from Nikkei NEEDS Financial-QUEST. Financial data like ROA and equity ratio and company information are derived from Nikkei Value Search. Nikkei Telecom21, a data base of Nikkei news reports, are used to identify the announcement day. This study uses the day of first Nikkei reports on equity carve-outs to proxy the event day. If the announcement day cannot be identified in this way, the day of public announcement from parent firms are used to proxy the event day instead.

Table 1 presents the distribution of the 96 equity carve-outs across the 11-year period. In general, 96 equity carve-outs cases are scattered over the 11-year timeline. However, the first half of 2000s has attracted the majority of equity carve-outs cases (74 observations), leaving year 2008, year 2009 and year 2010 with 2, 0, 1 deal(s) each. All the subsidiaries in the sample were listed in two stock exchanges, one existing stock exchange and one emerging stock exchange. 45 subsidiaries were listed in Tokyo Stock Exchange, either the first section (東証一部) or the second section (東証二部). Other 51 subsidiaries were listed in JASDAQ. In addition, frequency of equity carve-outs in Japan dropped quickly after 2007.

Table 1
Distribution of ECOs across years and stock markets

Year	Tokyo Stock Exchange	JASDAQ	Total
2000	10	7	17
2001	3	9	12
2002	6	6	12
2003	6	5	11
2004	5	8	13
2005	5	4	9
2006	7	3	10
2007	1	8	9
2008	1	1	2
2009	0	0	0
2010	1	0	1
Total	45	51	96

4.2. Short-term and long-term stock performance after ECOs

This study aims to analyze the short-term and long-term stock price performance of parent firms surrounding and after the announcement of equity carve-outs. This study adopts the classical event study approach to measure the market reaction to equity carve-outs announcements surrounding event day. The short-term market reaction is examined by calculating excess returns over the period of -5 to 5 days during which the announcement day, defined as the day of first Nikkei news report of equity carve-outs plan, is defined as day 0. According to the efficient market hypothesis, all information, no matter publicly accessible or inside, should be inflected by stock price immediately. Therefore, the market model is employed to calculate abnormal returns surrounding the day of equity carve-outs announcements. Making use of the market model for the event window of day -5 to day 5, we can calculate the abnormal return as the difference between ex-post return and normal returns in the following way:

$$AR_{it} = R_{it} - \left(\hat{\alpha} + \hat{\beta} * R_{mt}\right) \quad (1)$$

in which:

R_{it} is the rate of return for stock i on day t.

R_{mt} is the rate of return of the market portfolio on day t, proxied by TOPIX (Tokyo Stock Price Index).

α and β are the market model parameter estimated using 200 observations over the estimation window, a time period of [-230, -31].

There is one main problem when evaluating the long-term valuation effect of equity carve-outs. That is the non-standard distribution of returns for long-term stock performance, according to Thomadakis et al. (2012). Barber and Lyon (1997) contend that when evaluating long-term stock performance, those commonly used approaches can lead to biased results. In this case, they favor the use of buy-and-hold abnormal returns (BHARs) over the use of traditional cumulative abnormal returns (CARs). Also, they argue that the distribution of buy-and hold abnormal returns (BHARs) does not have a zero mean and has a positive skewness. In this study, buy-and-hold abnormal returns (BHARs) method are employed to gauge the long-term valuation

effect of equity carve-outs. Buy-and-hold abnormal returns are calculated for 12 and 24 months after the equity carve-outs announcement day or announcement month.

$$\mathrm{BHAR_{it}} = \prod_{t=0}^{T}(1 + \mathrm{R_{it}}) - \prod_{t=0}^{T}(1 + \mathrm{R_{mt}}) \quad (2)$$

in which:

R_{it} is the rate of return of security i in month t

R_{mt} is the rate of return of Tokyo Stock Price Index (TOPIX) in month t

In order to test the statistical significance of BHARs, the average buy-and-hold abnormal returns (ABHARs). Average buy-and-hold abnormal returns is the weighted average of the buy-and-hold returns based on market capitalization of the sample firms. Lyon et al. (1999) recognized the problem that the buy-and-hold abnormal returns of the event company are not independent and therefore conventional t-statistics cannot be used. Therefore, this study calculates adjusted t-statistics (Lyon et al., 1999) in the following way:

$$t_{skewness-adjusted} = \sqrt{N}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6N}\hat{\gamma}\right) \quad (3)$$

in which:

N is the number of firms in the sample

$\hat{\gamma}$ is the estimate of coefficient of skewness and $\hat{\gamma} = \frac{\sum_{i=1}^{N}(\mathrm{BHAR_{it}} - \mathrm{ABHAR_t})^3}{\mathrm{N}\sigma(\mathrm{BHAR_t})^3}$

$S = \frac{\mathrm{ABHARS_t}}{\sigma(\mathrm{BHAR_t})}$ and $\sigma(\mathrm{BHAR_t})$ are the cross-sectional standard deviations of the buy-and-hold returns for the sample.

4.3. Regression analysis of CARs and BHARs

This study employs 3-day cumulative abnormal return (CAR [-1, 1]) as the dependent variable and to analyze the factors behind 3-day cumulative abnormal returns and long-term valuation effect, this study selects the following 7 explanatory variables.

The first explanatory variable is the profitability of parent firms. This study uses return on asset (ROA) as the proxy for profitability of the parent company. If the ROA of a certain firm is low, it usually means this parent company may not have abundant cash flow and may have difficulty in fund raising. In the case of subsidiary not going public, both parent company and subsidiary, facing low cash flow and difficulty in fund raising, might abandon promising investing

activities. In the case of equity carve-outs, however, the fund raising will be easier for subsidiary and parent company can use the fund raised from equity carve-outs to engage in profitable investing activities or to lower the leverage of parent company. Therefore, this study predicts that lower the ROA, higher the CARs should be the case in Japan.

The second explanatory variable is the parent firm's control over subsidiary for parent firms. This study uses the shareholding ratio of parent firms right after equity carve-outs to proxy this explanatory variable. The effect of parent firm's control over subsidiary on CARs should be mixed. Lower shareholding ratio of parent firms after equity carve-outs means the subsidiary will be more independent. The increase of independence level for subsidiaries can have one plus effect and one minus effect on the stock of parent firms. The positive one comes from the possible easing of conglomerate discount. As for the negative one, in the case of low shareholding ratio for parent firm, the synergy effect may decrease. The comprehensive effect of this explanatory effect depends on which effect is stronger.

The third explanatory variable is the percentage change of shareholding ratio. This is the difference between the shareholding ratio of parent firms before equity carve-outs and the shareholding ratio of parent firms right after equity carve-outs. When the percentage change of shareholding ratio is big, usually it means there is a tremendous change in ownership structure of the subsidiary. If the change in ownership structure leads to better management, then the coefficient of this explanatory variable is plus; otherwise, the coefficient should be minus.

The fourth explanatory variable is the capital structure of parent firms. This study uses leverage ratio to proxy the capital structure of parent firms. When the leverage of parent firms is high, usually than not, they will find difficulty in raising funds from outside because of relatively high-risk of bankruptcy. Like the case of the first explanatory variables (ROA), this study predicts equity carve-outs can ease parent company's difficulty in capital raising from outside. Therefore, this study predicts that

The fifth explanatory variable is the ratio of funds raised from ECOs to the market value of parent firm.

The sixth explanatory variable is the relatedness between the business of parent firms and that of subsidiaries. This study uses Nikkei's industrial classification code (中分類) to proxy the

relatedness between the business of parent firms and that of subsidiaries. The value of this dummy variable is 1 if Nikkei's industrial classification code of parent firms and subsidiaries are the same; otherwise, the value of this dummy variable is 0. The effect of relatedness between the business of parent firms and that of subsidiaries on cumulative abnormal returns is hard to predict on theory.

The seventh explanatory variable refers to the place where the subsidiary went public. The value of this explanatory variable is 0 if the subsidiary were listed in existing market (the first section or the second section of Tokyo Stock Exchange); if the subsidiary were listed in emerging market (JASDAQ), the value of this dummy variable is 1.

Table 2 summarizes the all 7 explanatory variables mentioned above.

Table 2
List of explanatory variables

Name of variable	
ROA	Return on assets
STO*	Shareholding ratio of parent firm right after ECOs
VSTO*	Percentage change of shareholding ratio
LEV*	Leverage ratio of parent firms
RFUND*	The ratio of funds raised from ECOs to the market value of parent firm
IND	Dummy variable, same industry or not
MAR	Dummy variable, existing market or JASDAQ

Note: * denotes logarithm

4.4. Changes in operating performance surrounding ECOs year

This study investigates changes in ROA, defined as net income scaled by total assets and adjusted ROA, defined as the difference between ROA of sample firms and industry average. This study defines the year of equity carve-outs as year 0 and those two ratios are investigated over the time period of [-1, 2]. The statistical significance of mean differences in ROA and adjusted ROA is tested by standard t-test. Also, leverage level of parent firms and subsidiaries surrounding the equity carve-outs year (year 0) will be investigated.

To gauge the effect of equity carve-outs on subsidiaries, the changes in adjusted asset growth, which is the difference between asset growth rate of sample subsidiaries and that of industry average and adjusted ROA, which is the differences between sample firms and industry average, are investigated.

5. Empirical Results

5.1. Stock market reaction for parent firms

5.1.1. Short-term market reaction to ECOs announcements

Table 3 shows the results of short-term stock price reaction to the announcements of equity carve-outs for parent firms on day -1, day 0 and day +1, as well as for 11-day window surrounding the ECOs announcement day (day 0). The empirical results in the all-sample Panel A of Table 3 show that parent firms enjoy an abnormal return of 0.998% on the announcement day and a 3-day CARs of 1.943%, both of which are statistically significant at the 1% level. These results indicate that Japanese stock market reacts positively to ECOs announcements, as are the cases in Europe and the United States. Also, this study has observed a statistically positive abnormal stock price movement prior to the announcement day, implying that there might be information leakage which leads to the exploitation of excess returns. Panel B and Panel C of Table 3 also show the empirical results of sub-group categorized by the stock exchange on which the subsidiaries are listed. Empirical results show that valuation effects are more significant for parent firms whose subsidiary are listed in emerging stock exchange (JASDAQ).

Table 3
Abnormal returns for parent firms around ECOs

Panel A: Full sample of ECO announcements		
N=96	Market Model	
Event days	AR%	t-value
-1	0.895**	2.124
0	0.998***	2.369
1	0.049	0.116
Interval	CAR%	t-value
CAR(-1,+1)	1.943***	4.612
CAR(-5,+5)	1.651***	3.920
Panel B: Existing stock exchange		
N=45	Market Model	
Event days	AR%	t-value
-1	0.549	1.289
0	0.712	1.671
1	-0.120	-0.283
Interval	CAR%	t-value
CAR(-1,+1)	1.141***	2.679
CAR(-5,+5)	1.095***	2.571
Panel C: JASDAQ		
N=51	Market Model	
Event days	AR%	t-value
-1	1.201***	2.818
0	1.254***	2.942
1	0.198	0.464

Interval	CAR%	t-value
CAR (-1, +1)	2.653***	6.224
CAR (-5, +5)	2.141***	5.022

Notes: This table shows the stock market reaction to parent firms in Japan at the day of ECOs announcements. AR refers to the average daily adjusted return. In Panel A, AR on day 0 and CAR(-1,+1) of all 96 samples are both positive and statistically significant, implying that ECOs can increase the wealth of shareholders.
*Significant at the 10% level
**Significant at the 5% level
***Significant at the 1% level.

5.1.2. Long-term market reaction to ECOs announcements

Apart from the substantial and growing body of literature that highlights the positive announcement effects of ECOs, there is also a branch of studies analyzing the long-term abnormal returns following ECOs. The analysis of long-term performance aims to accurately capture the total value created by corporate events such as ECOs. Though the long-term stock market performance of US carve-outs has been adequately investigated, very few studies on the long-term performance of Japanese carve-outs have been conducted to date. Table 4 shows the results of long-term market reaction to ECOs announcements. Specifically, parent firms earn negative buy-and-hold returns for all periods following the carve-out transaction; approximately -9.86% in the 6-month period afterward (significant at 1% level) and -13.06% in the 24-month period after transaction (significant at 1% level). Overall, this results from the long-term parent stock performance are similar to the majority of cases in the U.S. stock market. For example, Madura and Nixon (2002) observe a buy-and-hold return of −7.19% in year +1 and −12.97% by the end of year +2 in the United States.

Table 4
Long-term performance of parent firms following ECOs

	Month (+1, +6)	Month (+1, +12)	Month (+1, +24)
BHAR%	-9.86%	-11.12%	-13.06%
t-statistic	-3.47***	-4.33***	-4.69***

Notes: Long-term abnormal returns are estimated using the buy-and-hold returns (BHARs). BHARs are calculated for 6, 12, and 24 months subsequent to the equity carve-out announcement month as the difference between the compounded actual return of the parent firm and the compounded return of the market. *, **, *** denote statistical significance at the 10%, 5% and 1% level respectively.

5.2. Long-term operating performance of parent firms

This study also conducts an investigation into the long-term operating performance of parent

firms. To measure this, this study employs ROA, adjusted ROA and leverage ratio from year -1 to two years after the event year (year 0). Table 5 shows the changes in ROA, Adj ROA and leverage level of parent companies surrounding the carve-out year. Theoretically, if the parent firm uses funds from ECOs transactions for operational restructuring, both ROA and Adj ROA will increase; if the parent firm uses funds from ECOs for financial restructuring, the leverage level will decrease. In Table 4, both ROA and Adj ROA deteriorate from year -1 to year +2. Averages of Adj ROA are positive through 3-year period, meaning the operating performance of parent firms is better than the industry average. Leverage level drops from year -1 to year +2 and decreases more to year +2, implying that parent firms may use the funds from ECOs to lower the leverage.

Table 5
Changes in financial ratios of parent firms

		Year -1	Year 0	Year 1	Year 2	(2)-(-1)
ROA	mean	5.172	4.875	5.012	4.814	-0.358*
Adj ROA	mean	0.489	0.311	0.264	0.169	-0.32***
LEV	mean	0.366	0.354	0.351	0.344	-0.022**

Notes: ROA is operating profits divided by total assets. Adj ROA is the difference between ROA of sample firms and ROA of industry average. *, **, *** denote statistical significance at the 10%, 5% and 1% level respectively.

5.3. Long-term operating performance of subsidiaries

Table 6 shows the operating performance and growth rate of the subsidiary surrounding the carve-out year. Adjusted asset growth in year -1 is higher than that of year +2, significant at 1% level. In addition, both adjusted ROA and ROA tend to decrease after carve-out year. These results imply that ECOs itself did not help subsidiaries improve their operating performance.

Table 6
Changes in operating performance of subsidiaries

		Year -1	Year 0	Year 1	Year 2	(2)-(-1)
Adj asset growth	mean	0.167	0.341	0.121	0.101	-0.066***
ROA	mean	12.324	11.103	9.562	7.921	-4.403***
Adj ROA	mean	6.261	5.872	4.125	3.974	-2.287***

Notes: The carve-out year is defined as year 0. Adj asset growth is asset growth rate of sample subsidiaries minus industry average. Adj ROA is ROA of sample subsidiaries minus industry average. Test for mean uses the standard t-test.
*** Significant at 1% level

5.4 Regression analysis

Finally, Table 6 shows the results of OLS regression using 3-day abnormal return, CAR(-1,+1)

as the dependent variable.

Table 7
Regression results for parent company's CAR on ECO announcements

	CAR(-1,+1)	p value
Intercept	-0.1770	0.172
ROA	0.0063	0.042**
STO	0.0725	0.101
VSTO	-0.0954	0.095*
LEV	0.0384	0.018**
RFUND	0.0121	0.944
IND	0.0020	0.712
MAR	0.0101	0.675
Adjusted R^2	0.092	

Notes: The dependent value is the 3-day abnormal return, CAR (-1,+1). P-values are calculated following White (1980) to adjust for heteroskedasticity.
* Significant at 10% level
** Significant at 5% level

The coefficient of variable ROA is positive and the result is significant at 5% level. This implies that market favors the equity carve-outs of companies that have high profitability. The coefficient of variable VSTO (percentage change of shareholding ratio) is minus, meaning that the market views the change of subsidiaries' structure change as a good sign. The more outstanding shares parent companies sell, the higher CAR will be. The coefficient of variable LEV (leverage level of parent firms right before ECOs) is positive and statistically significant at 5% level, implying that market reacts more positively when parent firms are highly leveraged. The coefficient of IND (whether the parent company and subsidiary are in the same industry or not) is positive. To summarize, parent companies which conform the following rules will probably increase the wealth of shareholders. Firstly, parent companies have good profitability but highly leveraged. Secondly, parent companies still own majority or a big portion of subsidiaries' outstanding shares after carve-outs transaction. Thirdly, the change of shareholding ratio of parent companies on subsidiaries is huge. Lastly, results show that the market favors the parent companies whose subsidiaries are list in emerging stock exchange instead of existing stock exchange, although the results are not significant.

6. Conclusions

The main purpose of this study is to examine the valuation effect of Japanese equity carve-outs. Previous research, mainly focusing on U.S. market, shows that carving out subsidiaries yield to statistically significant positive abnormal return for the shareholders of parent companies.

Employing 96 Japanese ECOs cases, this study yields two main findings. Firstly, the valuation effect of equity carve-outs exists in Japanese stock market, meaning the announcement of ECOs can push up the stock price of parent firms surrounding the carve-out day. The statistically positive cumulative abnormal return is higher for parent companies which have good profitability and high leverage level. This finding is in accordance with parent-financing hypothesis. However, a notable stock price reverse is spotted in the subsequent period of ECOs transaction which lasts up to 24 months at least. This study also examines the changes in the operating performance and leverage level of both parent firms and subsidiaries surrounding the carve-out year. This paper finds that operating performance of both parent firms and subsidiaries, proxied by Adj ROA and ROA, deteriorate after ECOs transaction and the leverage level of parent firms and subsidiaries drops after carve-outs. Lastly, this study finds that Japanese stock market favors equity carve-outs of parent company which has good profitability (high ROA) and high leverage.

7. Acknowledgement

This study thanks Prof. Kawaguchi Yuichiro for his excellent and kind research guidance. The author also wants to thank Prof. Suzuki Kazunori and Prof. Arikawa Yasuhiro for the corporate finance know-how and methodology they taught at Seminar on Empirical Analysis of Corporate finance and Seminar on Economics.

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